

# Claims

- [c1] A method of making a shoe correction for the alignment of a person's foot, comprising the steps of:  
while the person is standing on the foot, inclining the person's lower leg forwardly about the foot a preselected angle from the vertical; and  
while maintaining the person's lower leg in the forward inclined position at the preselected angle, measuring the lateral angular alignment of the foot.
- [c2] A method of making a shoe correction for the alignment of a person's foot according to claim 1 and further comprising the step of selecting from a database appropriate corrective components for incorporation into a shoe to correct the alignment of the person's foot.
- [c3] A method of making a shoe correction for the alignment of a person's foot according to claim 2 wherein the database has a correlation between a range of lateral angular alignment values and appropriate corrective components.
- [c4] A method of making a shoe correction for the alignment of a person's foot according to claim 3 wherein the cor-

rective components include combinations of corrective alignment insole components.

- [c5] A method of making a shoe correction for the alignment of a person's foot according to claim 4 wherein the corrective alignment insole components include supination, pronation, and arch control pads.
- [c6] A method of making a shoe correction for the alignment of a person's foot according to claim 5 and further comprising the step of constructing a corrective alignment insole from a base insole and the selected supination, pronation, and arch control pads.
- [c7] A method of making a shoe correction for the alignment of a persons foot according to claim 6 wherein the database further includes a correlation between lateral angular alignment values and an appropriate shoe type.
- [c8] A method of making a shoe correction for the alignment of a person's foot according claim 7 and further comprising the step of incorporating the corrective alignment insole into the selected shoe type.
- [c9] A method of making a shoe correction for the alignment of a person's foot according to claim 8 wherein the measuring step is carried out with the aid of a subtalar joint goniometer.

- [c10] A method of making a shoe correction for the alignment of a person's foot according to claim 9 wherein the measuring step includes the step of inscribing a reference line along the Achilles' tendon portion of the person's foot.
- [c11] A method of making a shoe correction for the alignment of a person's foot according to claim 10 wherein the measuring step further includes the step of measuring the lateral angular alignment of the reference line.
- [c12] A method of making a shoe correction for the alignment of a person's foot according to claim 3 wherein the corrective components include supination, pronation, and arch control pads.
- [c13] A method of making a shoe correction for the alignment of a person's foot according to claim 12 wherein the database further includes a correlation between lateral angular alignment values and an appropriate shoe type, and further comprising the step of selecting from the database an appropriate shoe type that correlates with the measured lateral angular alignment of the foot.
- [c14] A method of making a shoe correction for the alignment of a person's foot according to claim 3 and further comprising the step of constructing a corrective alignment

shoe by incorporating into the shoe the selected corrective components.

- [c15] A method of making a shoe correction for the alignment of a person's foot according to claim 3 and further comprising the step of constructing a corrective alignment insole from a base insole and the selected corrective components.
- [c16] A method of making a shoe correction for the alignment of a person's foot according to claim 2 and further comprising the step of constructing a corrective alignment shoe by incorporating into the shoe the selected corrective components.
- [c17] A method of making a shoe correction for the alignment of a person's foot according to claim 2 and further comprising the step of constructing a corrective alignment insole from a base insole and the selected corrective components.
- [c18] A method of making a shoe correction for the alignment of a person's foot according claim 17 and further comprising the step of incorporating the corrective alignment insole into the selected shoe type.
- [c19] A method of making a shoe correction for the alignment of a person's foot according to claim 1 wherein the mea-

suring step is carried out with the aid of a subtalar joint goniometer.

- [c20] A method of making a shoe correction for the alignment of a person's foot according to claim 1 wherein the measuring step includes the step of inscribing a reference line along the Achilles' tendon portion of the person's foot.
- [c21] A method of making a shoe correction for the alignment of a person's foot according to claim 20 wherein the measuring step further includes the step of measuring the lateral angular alignment of the reference line.
- [c22] A method of making a shoe correction for the alignment of a person's foot, comprising the steps of:  
measuring the lateral angular alignment of the person's foot with respect to the lower portion of the leg; and  
selecting from a database appropriate corrective components for incorporation into a shoe to correct the alignment of the person's foot.
- [c23] A method of making a shoe correction for the alignment of a person's foot according to claim 22 wherein the database has a correlation between a range of lateral angular alignment values and appropriate corrective components.

- [c24] A method of making a shoe correction for the alignment of a person's foot according to claim 23 wherein the corrective components include combinations of corrective alignment insole components.
- [c25] A method of making a shoe correction for the alignment of a person's foot according to claim 24 wherein the corrective alignment insole components include supination, pronation, and arch control pads.
- [c26] A method of making a shoe correction for the alignment of a person's foot according to claim 25 wherein the database further includes a correlation between lateral angular alignment values and an appropriate shoe type.
- [c27] A method of making a shoe correction for the alignment of a person's foot according to claim 26 and further comprising the step of constructing a corrective alignment insole from a base insole and the selected supination, pronation, and arch control pads.
- [c28] A method of making a shoe correction for the alignment of a person's foot according to claim 27 and further comprising the step of selecting from the database an appropriate shoe type that correlates with the measured lateral angular alignment of the foot.

- [c29] A method of making a shoe correction for the alignment of a person's foot according claim 28 and further comprising the step of incorporating the corrective alignment insole into the selected shoe type.
- [c30] A method of making a shoe correction for the alignment of a person's foot according to claim 22 wherein the measuring step is carried out with the aid of a subtalar joint goniometer.
- [c31] A method of making a shoe correction for the alignment of a person's foot according to claim 22 wherein the measuring step includes the step of inscribing a reference line along the Achilles' tendon portion of the person's foot.
- [c32] A method of making a shoe correction for the alignment of a person's foot according to claim 31 wherein the measuring step further includes the step of measuring the lateral angular alignment of the reference line.
- [c33] A kit for quantifying and making a shoe correction for a misalignment of a person's foot, comprising:  
a dorsiflexion template adapted to position the person's lower leg at a preselected forward angle with respect to an upper surface of the person's foot adjacent the ankle when the person is standing on the foot; and

a subtalar joint inclinometer to measure the lateral angular alignment of the person's foot when the person's lower leg is inclined at the preselected angle.

[c34] A kit for quantifying and making a shoe correction for a misalignment of a person's foot according to claim 33 and further comprising at least one corrective alignment insole component.

[c35] A kit for quantifying and making a shoe correction for a misalignment of a person's foot according to claim 34 wherein the at least one corrective insole component comprises:

a base insole in the general shape of a person's footprint having a lateral portion, a medial portion, and an arch stability portion;

at least one supination control pad for adjusting the supination alignment of the person's foot;

at least one pronation control pad for adjusting the pronation alignment of the person's foot; and

at least one arch control pad for adjusting the support of the person's arch.

[c36] A kit for quantifying and making a shoe correction for a misalignment of a person's foot according to claim 35 and further comprising a database which correlates a range of lateral angular alignment values combinations



with at least one of the corrective alignment insole components;

wherein the at least one of the corrective alignment insole components can be selected from the database based upon the lateral angular alignment measurement obtained from the subtalar joint inclinometer.

- [c37] A corrective alignment insole assembly for making a shoe correction for the alignment of a person's foot, comprising:
- a base insole in the general shape of a person's footprint having a lateral portion, a medial portion, and an arch stability portion, and adapted for correcting both pronation and supination in combination with at least one of at least one supination control pad, at least one pronation control pad, or at least one arch control pad;
  - at least one supination control pad for adjusting the supination alignment of the person's foot;
  - at least one pronation control pad for adjusting the pronation alignment of the person's foot; and
  - at least one arch control pad for adjusting the support of the person's arch;
- wherein the at least one supination control pad, the at least one pronation control pad, and the at least one arch control pad are selected based upon a lateral angular alignment measurement of the person's foot.

[c38] The corrective alignment insole assembly of claim 37 wherein the base insole is divided into an irregularly-shaped supination control portion extending along the lateral portion of the base insole, an irregularly-shaped motion control portion extending along the medial portion of the base insole, and a crescent-shaped arch stability portion extending along the arch portion of the base insole.

[c39] The corrective alignment insole assembly of claim 38 wherein the at least one supination control pad comprises an irregularly-shaped member having a variable wedge-shaped cross section corresponding in size and shape to the supination control portion of the base insole, and having an anterior end, a posterior end, a medial edge, and a lateral edge, wherein the thickness of the at least one supination control pad decreases from the lateral edge to the medial edge, and from a portion along the lateral edge to the anterior end and the posterior end.

[c40] The corrective alignment insole assembly of claim 39 wherein the at least one supination control pad ranges in thickness from a maximum of 3/16 inch at the center lateral edge to 1/16 inch at the posterior end, to zero inches at the anterior end and along the medial edge.

- [c41] The corrective alignment insole assembly of claim 40 wherein the at least one supination control pad comprises an irregularly-shaped supplementary supination control pad portion located at the center lateral portion of the at least one supination control pad.
- [c42] The corrective alignment insole assembly of claim 41 wherein the at least one supination control pad comprises a supplementary supination control pad comprising an irregularly-shaped member having a generally wedge-shaped cross section corresponding in size and shape to the supplementary supination control pad portion, attached to the supination control pad at the supplementary supination control pad portion for increasing the maximum thickness of the supination control pad at its center lateral portion, and having an anterior end, a posterior end, a medial edge, and a lateral edge, wherein the thickness of the supination control pad decreases from the lateral edge to the medial edge, and from a portion along the lateral edge to the anterior end and the posterior end.
- [c43] The corrective alignment insole assembly of claim 42 wherein the supplementary supination control pad varies in thickness from a maximum of 1/8 inch at the center lateral edge to zero inches at the anterior end, the pos-

terior end, and the medial edge.

[c44] The corrective alignment insole assembly of claim 38 wherein the at least one motion control pad comprises an irregularly-shaped elongated member having a variable wedge-shaped cross section corresponding in size and shape to the motion control portion of the base insole, and having an anterior end, a posterior end, a medial edge, and a lateral edge, wherein the thickness of the at least one motion control pad decreases from the medial edge to the lateral edge, and from the portion along the medial edge to the anterior end and the posterior end.

[c45] The corrective alignment insole assembly of claim 44 wherein the at least one motion control pad ranges in thickness from a maximum of 3/16-inch along the anterior portion of the medial edge, to 1/8-inch at the posterior end, to zero inches at the anterior end and along the lateral edge.

[c46] The corrective alignment insole assembly of claim 45 wherein the at least one motion control pad comprises an irregularly-shaped supplementary motion control pad portion located at the anterior medial portion of the at least one motion control pad.

[c47] The corrective alignment insole assembly of claim 46 wherein the at least one motion control pad comprises a supplementary motion control pad comprising an irregularly-shaped member having a generally wedge-shaped cross-section corresponding in size and shape to the supplementary motion control pad portion, attached to the motion control pad at the supplementary motion control pad portion for increasing the maximum thickness of the motion control pad at its anterior medial portion, and having an anterior end, a posterior end, a medial edge, and a lateral edge, wherein the thickness of the at least one supplementary motion control pad decreases from the center medial edge to the anterior end, the posterior end, and the lateral edge.

[c48] The corrective alignment insole assembly of claim 47 wherein the supplementary motion control pad varies in thickness from a maximum of 1/8 inch at the center medial edge to zero inches at the anterior end, the posterior end, and the lateral edge.

[c49] The corrective alignment insole assembly of claim 38 wherein the at least one arch stability pad comprises a crescent-shaped member having a generally wedge-shaped cross section corresponding in size and shape to the arch stability portion of the base insole, and having an anterior end, a posterior end, a medial edge, and a

lateral edge, wherein the thickness of the at least one arch stability pad decreases from the center medial edge to the lateral edge, the anterior end and the posterior end.

[c50] The corrective alignment insole assembly of claim 49 wherein the at least one arch stability pad ranges in thickness from a maximum of 3/16 inch at the center medial edge to zero inch from the anterior end along the lateral edge to the posterior end.

[c51] The corrective alignment insole assembly of claim 50 wherein the at least one arch stability pad comprises a supplementary arch stability pad comprising a crescent-shaped member having a generally wedge-shaped cross-section for attachment to the at least one arch stability pad for increasing the maximum thickness of the at least one arch stability pad at the arch stability portion of the base insole, and having an anterior end, a posterior end, a medial edge, and a lateral edge, wherein the thickness of the supplementary arch stability pad decreases from the center medial edge to the lateral edge, the anterior end, and the posterior end.

[c52] The corrective alignment insole assembly of claim 51 wherein the supplementary arch stability pad varies in thickness from a maximum of 3/16 inch at the center

medial edge to zero inch from the anterior end along the lateral edge to the posterior end.

- [c53] The corrective alignment insole assembly of claim 37 wherein the base insole further comprises a resilient heel cushioning zone for cushioning impact to the heel.
- [c54] The corrective alignment insole assembly of claim 53 wherein the resilient heel cushioning zone comprises a pattern of cutout sections adapted to provide resilient cushioning immediately beneath the person's heel.
- [c55] The corrective alignment insole assembly of claim 53 wherein the resilient heel cushioning zone comprises a low density gel pad adapted to provides resilient cushioning immediately beneath the person's heel.
- [c56] The corrective alignment insole assembly of claim 55 wherein the low density gel pad comprises a low density gel polymer.
- [c57] A subtalar joint inclinometer for measuring the lateral angular alignment of a person's foot when the person is in a standing position, comprising:
  - an instrument having at least one pivotable wing for aligning the instrument with the person's Achilles tendon and determining a reference line thereof; and
  - an angle gauge for determining the inclination of the

reference line from a vertical direction when the person is in the standing position.

- [c58] The subtalar joint inclinometer according to claim 57 wherein the subtalar joint inclinometer comprises a base portion having an indicator arrow extending orthogonally upwardly therefrom and an alignment portion pivotally attached to the base portion having a protractor scale inscribed thereon;  
wherein the base portion is placed under the person's foot when the person is in the standing position, and the alignment portion is aligned with the person's Achilles tendon so that a lateral angular alignment value can be determined by reference to the protractor scale.
- [c59] The subtalar joint inclinometer according to claim 57 wherein the subtalar joint inclinometer comprises a calcaneal bisection gauge for inscribing the reference line and a protractor for determining the inclination of the reference line.
- [c60] A database for selecting at least one corrective alignment insole component for making a shoe correction for a misalignment of a person's foot based upon a measurement of a lateral angular alignment of the person's foot, comprising:  
a plurality of preselected lateral angular alignment val-



ues; and

at least one corrective alignment insole component;

wherein the preselected lateral angular alignment values are correlated to the at least one corrective alignment insole component so that the at least one corrective alignment insole component can be selected from the database based upon the lateral angular alignment measurement.

[c61] The database according to claim 60 wherein the database further includes a correlation between the plurality of lateral angular alignment values with a variety of shoe types and wherein the appropriate corrective shoe can be selected for use with the selected at least one corrective alignment insole component.

[c62] The database according to claim 60 wherein the at least one corrective alignment insole component includes at least one of a base insole, a supination control pad, a supplementary supination control pad, a motion control pad, and a supplementary motion control pad.

[c63] The database according to claim 62 wherein a lateral angular alignment value of  $-5^{\circ}$  to  $3^{\circ}$  correlates to an assembly of corrective alignment insole components comprising a base insole, a supination control pad, and a supplementary supination control pad.

- [c64] The database according to claim 62 wherein a lateral angular alignment value of 3° to 6° correlates to an assembly of corrective alignment insole components comprising a base insole, and a supination control pad.
- [c65] The database according to claim 62 wherein a lateral angular alignment value of 6° to 9° correlates to an assembly of corrective alignment insole components comprising a base insole.
- [c66] The database according to claim 62 wherein a lateral angular alignment value of 9° to 12° correlates to an assembly of corrective alignment insole components comprising a base insole, and a supplementary motion control pad.
- [c67] The database according to claim 62 wherein a lateral angular alignment value of 12° to 15° correlates to an assembly of corrective alignment insole components comprising a base insole, and a motion control pad.
- [c68] The database according to claim 62 wherein a lateral angular alignment value of greater than 15° correlates to an assembly of corrective alignment insole components comprising a base insole, a motion control pad, and a supplementary motion control pad.